1. INTRODUCTION

Project Overview:

The leading cause of death in the developed world is heart disease. Therefore, there needs to be work done to help prevent the risks of having a heart attack or stroke. We will be working with the heart disease prediction and for that, we will be looking into the heart disease dataset. From that dataset we will derive various insights that help us know the weightage of each feature and how they are interrelated to each other. Main aim is to detect the probability of a person that will be affected by a savior heart problem or not.

Purpose:

Heart is one the most vital organs in the human body. When we talk about heart diseases, we can have multiple conditions where the heart is not working the way it should be like blockage in blood vessels. According to many researches that have been conducted through a period of time have found out that heart failure and heart disease has been the cruel cause of death in human beings. What aggravates this situation is that most of these diseases are being diagnosed at later stages at which it is very difficult to control. But if somehow, we can diagnose these diseases at its early stage, then we can surely cure the disease

2. LITERATURE SURVEY

Existing problem:

In this system, the input details are obtained

from the patient. Then from the user inputs,using ML techniques heart disease is analyzed.

Now, the obtained results are compared with the results of existing models within the same domain and found to be improved. The data of heart disease patients collected from the UCI laboratory is used to discover patterns with NN,DT, Support Vector machines SVM, and Naive Bayes. The results are compared for performance and accuracy with these

algorithms. The proposed hybrid method returns results of 87% for F-measure, competing with the other existing methods.

References:

- V. Manikantan & S.Latha,"Predicting the Analysis of Heart Disease Symptoms Using Medicinal Data Mining Methods", International Journalon Advanced Computer Theory and Engineering, Volume-2, Issue-2, 2013.
- Dr.A.V.Senthil Kumar, "Heart Disease Prediction Using Data Mining preprocessing and Hierarchical Clustering", International Journal of
- Advanced Trends in Computer Science and Engineering, Volume-4, No.6, 2015.
- Uma.K, M.Hanumathappa, "Heart Disease Prediction Using Classification Techniques with Feature Selection Method", Adarsh Journal of

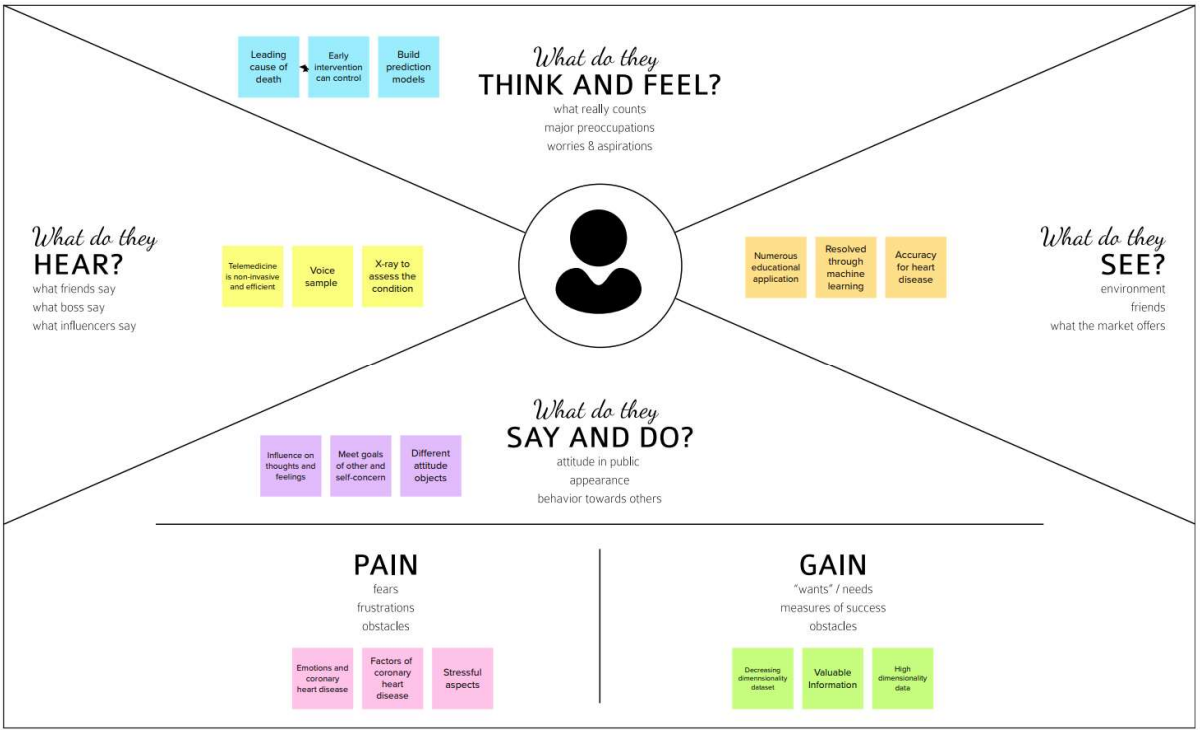
- Information Technology, Volume-5, Issue-2,
- Himanshu Sharma, M.A.Rizvi, “Prediction of Heart Disease using Machine Learning Algorithms:A Survey”,International Journal on Recent
- and Innovation Trends in Computing and Communication,Volume5,Issue-8
- S.Ghwanmeh,A.Mohammad,andA.Al-Ibrahim,“Innovative artificial neural networks-based decision support system for heart diseases diagnosis,”Journal of Intelligent Learning Systems and Application.
- Q. K. Al-Shayea, “Artificial neural networks in medical diagnosis,” International Journal of Computer Science Issues, vol. 8, no. 2, 2011.
- K. Vanisree and J. Singaraju, “Decision support system for congenital heart disease diagnosis based on signs and symptoms using neural networks,” International Journal of Computer Applications, vol. 19, no. 6, pp. 6–12, 2011.
- Al Mamoon I, Sani AS, Islam AM, Yee OC, Kobayashi F, Komaki S (2013) A proposal of body implementable early heart attack detection system, 1-4.

Problem Statement Definition:

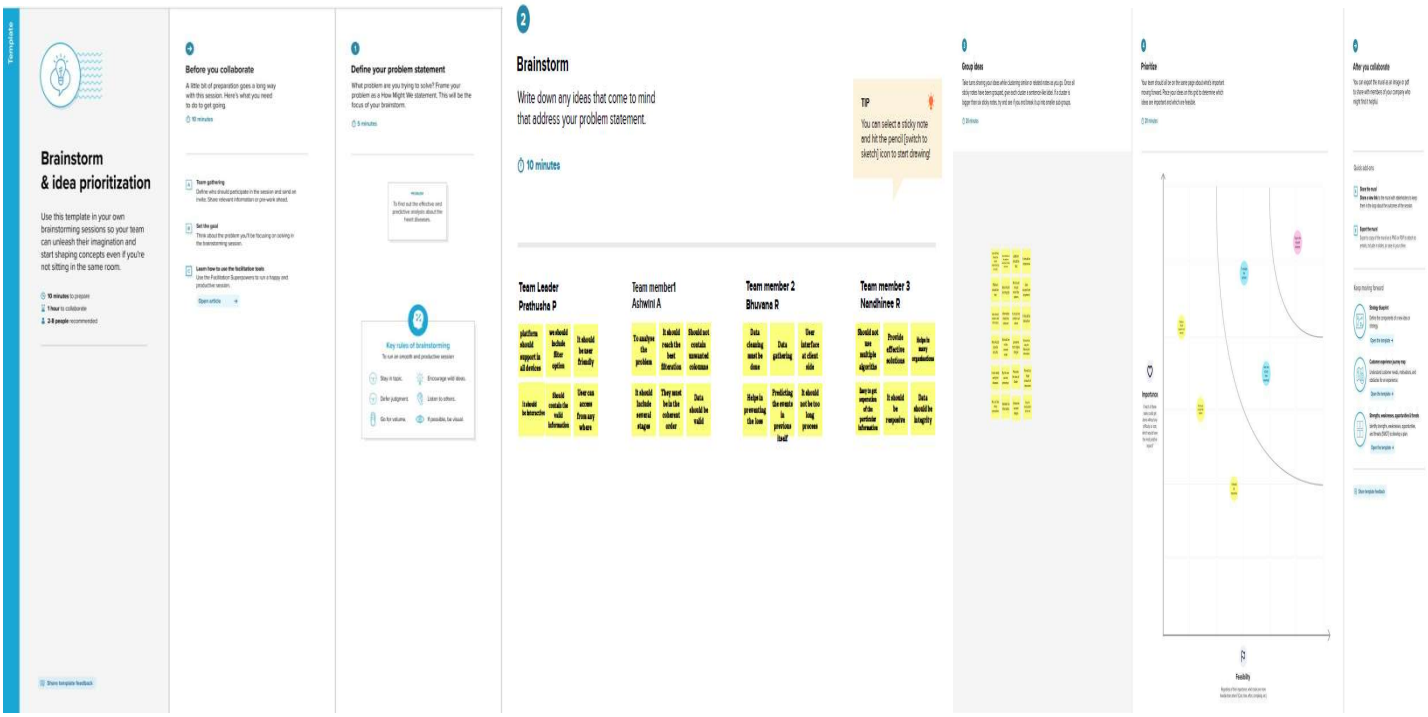
we will be working with the heart disease prediction and for that, we will be looking into the heart disease dataset from that dataset we will derive various insights that help us know the weightage of each feature and how they are interrelated to each other. Main aim is to detect the probability of person that will be affected by a savior heart problem or not.

3. IDEATION & PROPOSED SOLUTION

Empathy Map Canvas:



Ideation & Brainstorming:



Proposed Solution:

Project team shall fill the following information in proposed solution template.

S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The leading cause of death in the developed world is heart diseases. Therefore ,there needs to be work done to help prevent the risks of having a heart.
2.	Idea / Solution description	It can be prevented by creating an interactive dashboard by data analytics .By doing this we can predict the fore coming dangerous events.
3.	Novelty / Uniqueness	It can give correct and accurate information.

4.	Social Impact / Customer Satisfaction	In the point of social impact it has a great interactive dashboard for predicting the diseases.
5.	Business Model (Revenue Model)	It has a huge revenue when it comes to the market.
6.	Scalability of the Solution	It is has the easy manipulation of data.
		Reduces the biases and mistakes caused by the decisions of doctors based on their intuitions and experiences.
5.	Business Model (Revenue Model)	Data security. Easy to use. Constant updates according to necessity.
6.	Scalability of the Solution	Can be used in any platform (Windows, mac, etc.,). Adding new feature doesn't affect the performance of the system.

Problem Solution fit:

1. CUSTOMER SEGMENT(S) CS

Who is your customer?

- smokers
- people who have high blood pressure
- people who have high cholesterol
- people who have high lipoprotein
- Diabete patients
- people who have lack of regular exercise
- Thrombosis patients
- people who shortness of breath
- people who have Chest pain, chest tightness, chest pressure and chest discomfort (angina)
- people who have Pain in the neck, jaw, throat, upper bellyarea or back
- people who have Pain, numbness, weakness or coldness in the legs or arms if the blood vessels in those body areasare narrowed
- people who have overweight

6. CUSTOMER CONSTRAINTS SL

What constraints prevent your customers from taking action or limit their choicesof solutions?

- Lack of knowledge about heart disease.
- Negative thoughts of the customer.
- Personal characteristics and physical disability of the customer.
- Complex symptoms of heart failure.
- Psychological problems.
- Lack of support.
- Lack of hope in treatment.
- Economical background is major constraints that prevent the customer from taking action.
- Medical and disease related limitations.

5.AVAILABLE SOLUTIONS AS

Which solutions are available to the customers when they face theproblem or need to get the job done?What have they tried in the past?What pros & cons do these solutions have?

There are various solutions available for the people whoare affected with heart diseases.They are,

- Quit smoking
- get cholesterol test periodically
- eat plenty of fruits,vegetables and healthy foods with grains,sprouts,nuts etc.
- Exercise regularly
- Maintain a good physique.

If these solutions are properly followed then the people affected with disease can be cured naturally.

- But,along with these they have to go for regular medical checkup and test for any heart disease.
- If disease is found in heart they need to make arrangements under proper medications.

2. JOBS-TO-BE-DONE/PROBLEMS J&P

Which jobs-to-be-done (or problems) do you address fro your customers?There could bemore than one,explore different slides.

- Lives depending on medical support
- Financial insecurity
- shortness of breath
- may feel chest pain,chest tightness,chest pressure

9. PROBLEM ROOT CAUSE RC

What is the real reason that this problem exists? What is the backstory behind the need to do this job?

- Buildup of fatty plaques in the arteries is the most common cause of coronary artery disease.
- lack of exercise,obesity and smoking.
- Acute aortic insufficiency(AI).
- To cure the diseased patients especially to visualize the heart problemsand give relief to them.
- One backstory is that many children are now affected with hole in theheart and suffer a lot than elders, so this method is initiated.
- Heart is the first formed organ when human is formed in the womb so problem in this affects the whole body.
- Thus, this visualization is made and any such heart diseases is predicted with an interactive dashboard.

7. BEHAVIOUR BE

What does your customer do to address the problem and get the job done?

- **Regular, daily physical activity can lower the risk of heart disease. Physical activity helps control your weight.**
- **A healthy diet can help protect the heart, improve blood pressure and cholesterol, and reduce the risk of type 2 diabetes.**
- **One of the best things you can do for your heart is to stop smoking or using smokeless tobacco.Even if you're not a smoker, be sure to avoid secondhand smoke.**
- Maintain a healthy weight
- Get good quality sleep
- Manage stress
- **High blood pressure and high cholesterol can damage the heart and blood vessels. But without testing for them, you probably won't know whether you have these conditions. Regular screening can tell you what your numbers areand whether you need to take action.**

3. TRIGGERS TR

What triggers customers to act? i.e. seeing their neighbour installingsolar panels, reading about a more efficient solution in the news.

- Lifestyle changes
- Lives depending on medical support
- need to search for heart specialist with manageable price
- need to apply for health insurance
- Financial insecurity
- Anxiety
- shortness of breath
- may feel emotional stress
- may feel chest pain,chest tightness,chest pressure
- feel for fatigue

4. EMOTIONS: BEFORE / AFTER EM

How do customers feel when they face a problem or a job and afterwards?
i.e. lost, insecure > confident, in control - use it in your communication strategy & design.

- Before a person knows that he/she is affected with any kind of disease , they arehappy and do their work normally.
- They don't need to worry about their own body for any problems and do their work normally and comfortably.
- But, after a person comes to know about any kind of problems especially a heart disease,he/she becomes
- illness
- unhealthy
- stressed/depressed
- uncomfortable with their daily routines.
- Lifestyle becomes upside down.

10. YOUR SOLUTION SL

If you are working on an existing business, write down your current solution first,fill in the canvas, and check how much it fits reality.
If you are working on a new business proposition, then keep it blank until you fill inthe canvas and come up with a solution that fits within customer limitations, solves a problem and matches customer behaviour.

- Heart disease treatment depends on the cause and type of heart damage. Healthy lifestyle habits — such as eating a low-fat, low-salt diet, getting regular exercise and good sleep, and not smoking — are animportant part of treatment.
- If lifestyle changes alone don't work, medications may be needed to control heart disease symptoms and to prevent complications. The typeof medication used depends on the type of heart disease.
- Some people with heart disease may need a procedure or surgery. Thetype of procedure or surgery will depend on the type of heart disease and the amount of damage to the heart.

8. CHANNELS of BEHAVIOUR CH

8.1 ONLINE

What kind of actions do customers take online? Extract online channels from #7

- Online appointments with doctors..
- Research about the heart disease they are diagnosed with.
- Finding possible natural cures.

8.2 OFFLINE

What kind of actions do customers take offline? Extract offline channels from #7and use them for customer development.

- Maintaining proper diet and eating healthy food.
- Having adequate amount of sleep.
- Maintaining a calm and relaxed mindstate.
- Following the suggestions made by the doctors.
- Doing exercise and maintaining fitness.
- Taking the right doses of pills at the right time mentioned by doctors.

4. REQUIREMENT ANALYSIS

Functional requirement:

Following are the functional requirements proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Facebook Registration through Gmail Registration through google
FR-2	Account creation	Gmail and password for account creation
FR-3	User Confirmation	Confirmation via Email Confirmation via OTP
FR-4	Personal details for account	Name, age, sex, height, weight, previous medical records, etc for health account basic details
FR-5	Regular medical condition updation in app	Entry present medical records, symptoms, etc
		make decisions accordingly

Non-Functional requirements

Following are the non-functional requirements of the proposed solution

FR No.	Non-Functional Requirement	Description

NFR-1	**Usability**	Good mobile navigation will boost the usability of the entire product, helping users to enjoy all the features offered. Bad navigation will make it difficultto find things, making it less likely that users will ever experience the product the way the design team had envisioned. Our solution has better features in navigation such as hamburger menu, Bottom navigation, Top navigation, Cards, Tabs, Gesture-Based Navigation, Full-screen navigation, 3D touch. In our app, we're using general languageEnglish to make the app user-friendly

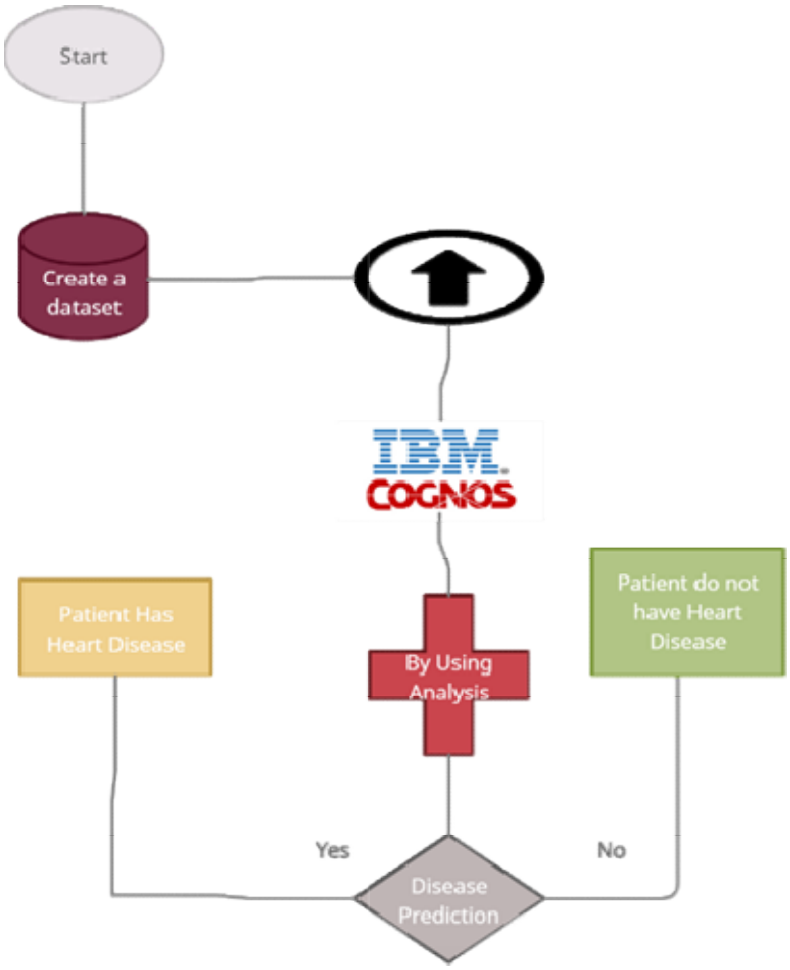
NFR-2	**Security**	To preserve user trust and device integrity is doneby making your app more secure. Our solution proposes **1.** Provide the right permissions- Request only the minimum number of permissions necessary for your app to function properly.When possible, relinquish permissions whenyour app no longer needs them**.** **2.** Store data safely- Store private data withininternal storage **3.** Ask for credentials before showing sensitiveinformation **4.** Keep services and dependencies up to date **5.** Apply network security measures such asAdd a network security configuration **6.** Use WebView objects carefully- WebView objects in your app shouldn't let users navigate to sites that are outside of your control. Whenever possible, use an allow listto restrict the content loaded by your app's WebView objects. **7.** Disallow access to your app's content providers-Unless you intend to send data from your app to a different app that you don't own, explicitly disallow other developers' apps from accessing your app'sContent Provider objects.
NFR-3	**Reliability**	1. Our app is made accessible whenever needed. 2. It Responds within the time frame needed 3. It is regularly updated or modified asneeded by the user. 4. Provide security and privacy to the extentneeded by the user. 5. Provide bug free operation that is simple and easily predictable
NFR-4	**Performance**	1. Our app responds quickly by making application size small, using CDN & appbundles and produces the output and ittakes lesser session length 2. Our app provides unique solution than thepresent system in the software 3. Special team is formed to reply queries ofthe users 24/7 4. Our app provides real time notificationsabout the user condition.
NFR-5	**Availability**	By setting up An Application Performance Monitoring (APM) system that helps to monitor theavailability of application. Consistent performance monitoring and optimization help you to tackle issues as quickly as they show up. Our app is designed in such a way that to emphasize availability

		by spreading data across clusters so that if one failsthe entirety of the data is not lost.
NFR-6	**Scalability**	A scalable app can easily accommodate double, triple, or even ten times its current amount of usersby withstanding no crashes, no downtime, Fast loading speeds, Top-notch security. We're gonna make our app more scalable by using right Tech stack & Infrastructure scaling to process millions of data with bug free , multiple database servers that accommodate millions of user to secure our app's fail-safe performance, using caching and stateless approach to reduce the load, Content Delivery Networks (CDN) to minimal response time.

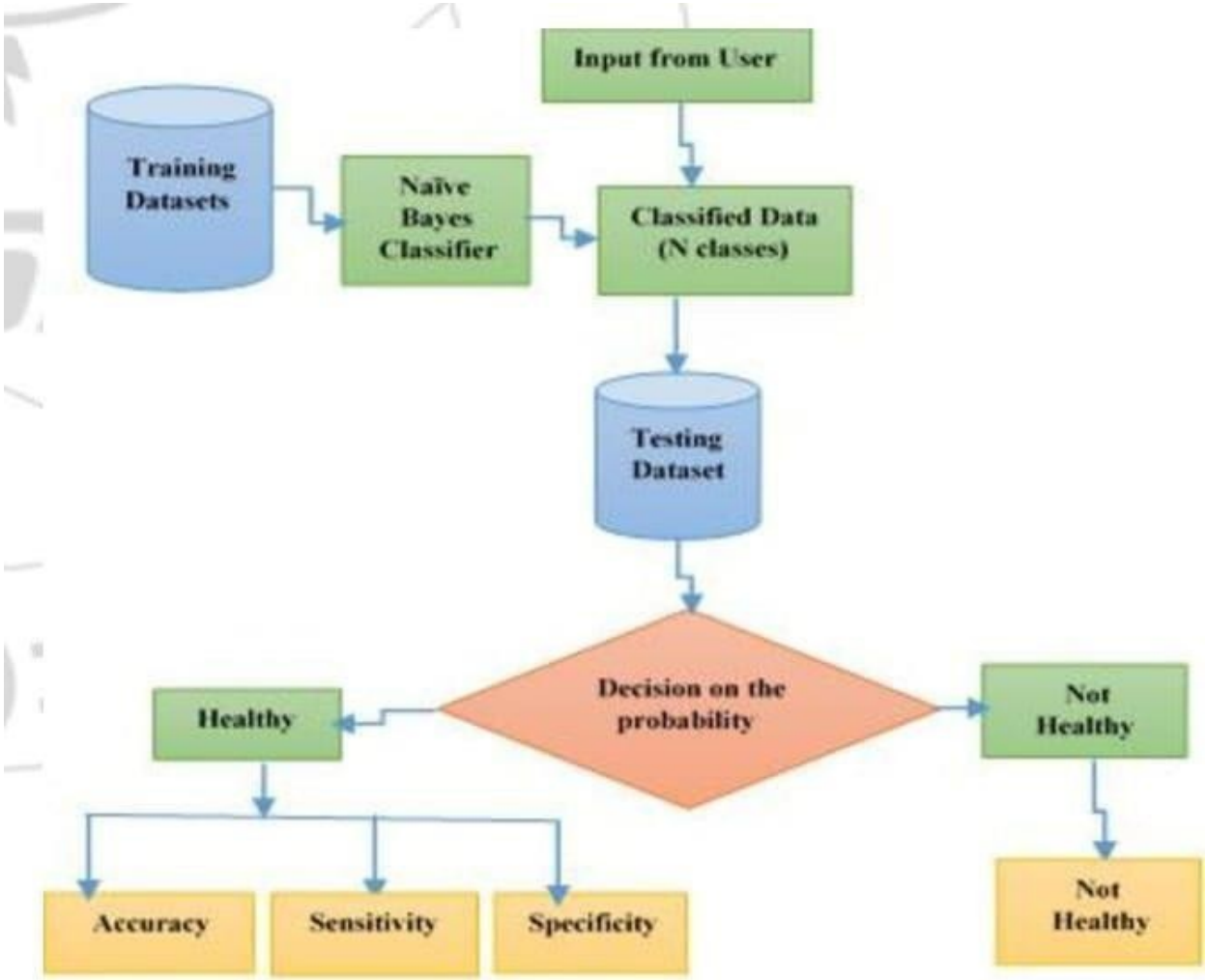
5. PROJECT DESIGN

Data Flow Diagrams:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



Solution & Technical Architecture:



Technology Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1

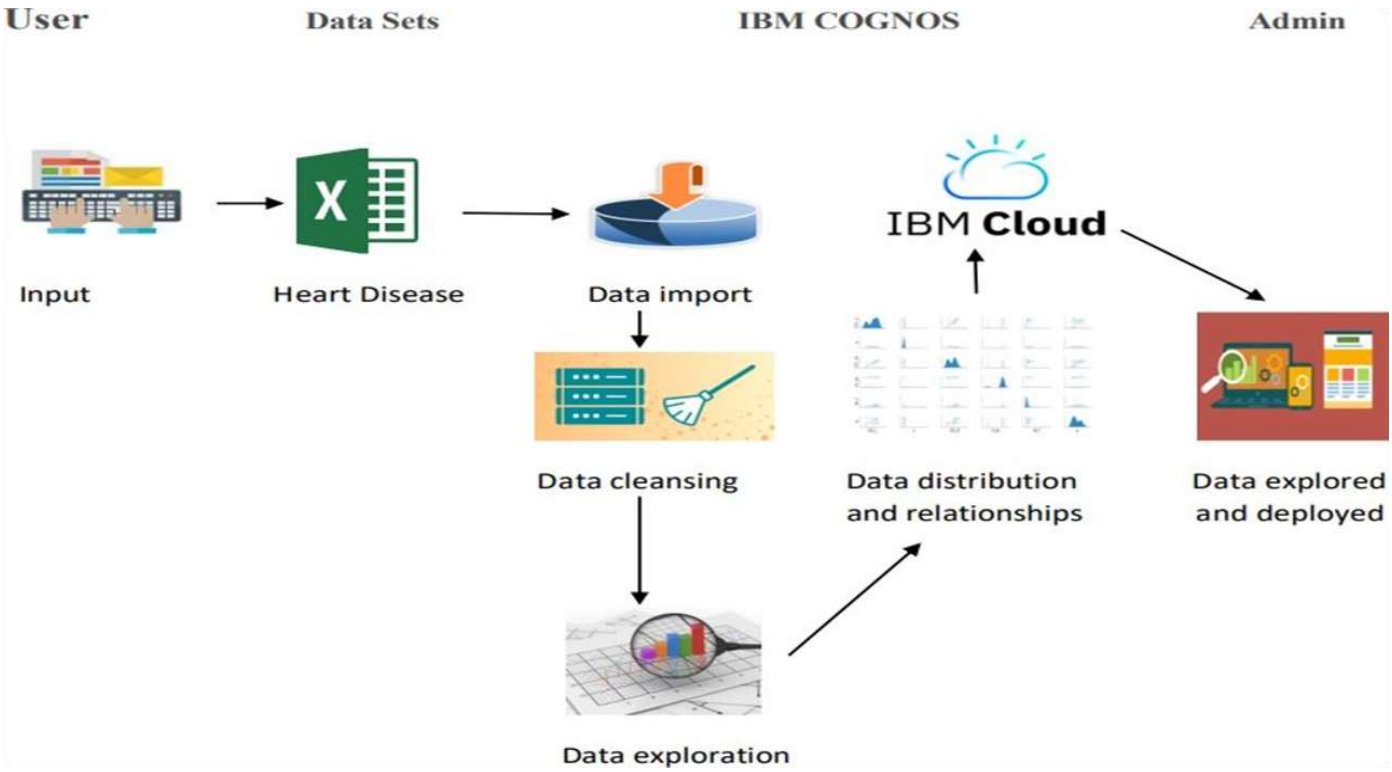

User
Data Sets
IBM COGNOS
Admin
Input
Heart Disease
Data import
IBM Cloud
Data cleansing
Data distribution and relationships
Data explored and deployed
Data exploration

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with application e.g., Web UI,	IBM Cognos / Python.
2.	Data Set	The data set prepared for heart disease	Python.
3.	IBM Cognos	Data analytics platform	IBM Watson service
4.	Data Import	Data set is imported in IBM Cognos	IBM Watson Assistant
5.	Data Cleaning	Data is cleaned by using some mathematical techniques such as mean, mode etc.to clean the null	IBM Assistant
6.	Data Exploration	Cleaned data can be explored.	IBM Cognos
7.	Story Card	Data is explored and story card was prepared for visual	IBM Cognos
8.	IBM Cloud	Storage of data	IBM DB2
9.	Data Explored and Deployed	Purpose of External API to explored and deployed	Data deployed to user by UI
10.	Admin	Purpose of Data set model	Recognition of data set model etc.

User Stories

User Type	User Story / Task	Acceptance criteria	Release
	View Doctors - view doctor detail by searching by names or filter by specialty	Using this application, people can known that the speciality doctors.	Sprint-1
Customer (Web user)	Hardware Requirement Laptop or PC I5 processor system or higher 4 GB RAM or higher 128 GB ROM or higher ii. Android Phone (12.0 and above)	These are all the specification available in your PC.	Sprint-2
	Reference- https://ieeexplore.ieee.org/document/9619208/	Go and Check our Reference link.	Sprint-1

Customer Care Executive	Query	You can post your queries in the text box available in that application.	Sprint-1
	Toll Free	Ask your doubts in given number(8365492107).	Sprint-1
	Ratings	Give your ratings as your wish.	Sprint-1
Administrator	Verification	Verification through CAPTCHA Verification through I’m not a robot	Sprint-1
	validation	Reconfirming the new password Sending a two digit number in (Google account) your Old devices, so that you can enter into a new device	Sprint-2

User Type	User Story / Task	Acceptance criteria	Release
		By entering the two digit number.	
	Feedback - send feedback to the Admin.	Please send your feedback to host.	Sprint-2

6. PROJECT PLANNING & SCHEDULING

Sprint Planning & Estimation:

Sprint	Total Story Point	Sprint Start Date	Sprint End Date (Planned)	Story Points Comple	Sprint Release Date (Actual)
Sprint-1	20	15 Oct 2022	18 Oct 2022	20	20 Oct 2022
Sprint-2	20	21 Oct 2022	23 Nov 2022	17	23 Nov 2022
Sprint-3	20	01 Nov 2022	03 Nov 2022	18	04 Nov 2022
Sprint-4	20	10 Nov 2022	14 Nov 2022	19	17 Nov 2022

Sprint Delivery Schedule

Product Backlog, Sprint Schedule, and Estimation

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	3	High	Prathusha Nandhinee Bhuvana Ashwini
Sprint-1		USN-2	As a user, I will receive confirmation email oncel have registered for the application	3	High	Prathusha Nandhinee Ashwini
Sprint-1		USN-3	As a user, I can register for the application through Facebook	5	Low	Prathusha Ashwini
Sprint-1		USN-4	As a user, I can register for the applicationthrough Gmail	3	Medium	Prathusha Nandhinee
Sprint-1	Login	USN-5	As a user, I can log into the application byentering email & password	6	High	Bhuvana Ashwini
Sprint-2	Dashboard	USN-6	Attractive dashboard For the Application	3	Medium	Prathusha Nandhinee Bhuvana Ashwini
Sprint-2		USN-7	Profile - view & update your profile	5	Low	Nandhinee Ashwini
Sprint-2		USN-8	Home - Analyze your Heart problem	2	High	Prathusha Bhuvana Ashwini

7. CODING & SOLUTIONING

Feature 1

Login page code:

```
<!DOCTYPE html>


<html lang="en" dir="ltr">

  <head>
```

```
    <meta charset="utf-8">
    <title>Login and Registration Form in HTML | CodingNepal</title>
    <link rel="stylesheet" href="css.css">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
  </head>
  <body>
    <div class="wrapper">
      <div class="title-text">
        <div class="title login">
          Login Form
        </div>
        <div class="title signup">
          Signup Form
        </div>
      </div>
      <div class="form-container">
        <div class="slide-controls">
          <input type="radio" name="slide" id="login" checked>
          <input type="radio" name="slide" id="signup">
```

```
    <label for="login" class="slide login">Login</label>
    <label for="signup" class="slide signup">Signup</label>
    <div class="slider-tab"></div>
  </div>
  <div class="form-inner">
    <form action="#" class="login">
      <div class="field">
        <input type="text" placeholder="Email Address" required>
      </div>
      <div class="field">
        <input type="password" placeholder="Password" required>
      </div>

      <div class="field btn">
        <div class="btn-layer"></div>
        <input type="submit" value="Login">
      </div>
      <div class="signup-link">
        Not a member? <a href="">Signup now</a>
```

```
            </div>
          </form>
          <form action="#" class="signup">
            <div class="field">
              <input type="text" placeholder="Email Address" required>
            </div>
            <div class="field">
              <input type="password" placeholder="Password" required>
            </div>
            <div class="field">
              <input type="password"  placeholder="Confirm  password"
required>
            </div>
            <div class="field btn">
              <div class="btn-layer"></div>
              <input type="submit" value="Signup">
            </div>
          </form>
        </div>
      </div>
```

```
</div>
<script>
  const loginText = document.querySelector(".title-text .login");
  const loginForm = document.querySelector("form.login");
  const loginBtn = document.querySelector("label.login");
  const signupBtn = document.querySelector("label.signup");
  const signupLink = document.querySelector("form .signup-link a");
  signupBtn.onclick = (()=>{
    loginForm.style.marginLeft = "-50%";
    loginText.style.marginLeft = "-50%";
  });
  loginBtn.onclick = (()=>{
    loginForm.style.marginLeft = "0%";
    loginText.style.marginLeft = "0%";
  });
  signupLink.onclick = (()=>{
    signupBtn.click();
    return false;
  });
```

```
    </script>
  </body>
</html>
```

```
@import
url('https://fonts.googleapis.com/css?family=Poppins:400,500,600,700&
display=swap');
*{
  margin: 0;
  padding: 0;
  box-sizing: border-box;
  font-family: 'Poppins', sans-serif;
}
.wrapper{
  height:75;
  width:175%;
  background-image: url('banner.jpg');
```

```
  background-position: center;
  background-size: cover;
  position: absolute;
}

html,body{
  display: grid;
  height: 100%;
  width: 100%;
  place-items: center;
  background-image: url('banner.jpg');
  position:absolute;
  background-repeat: repeat;
  background-size:60% ;

}
::selection{
  background: #fa4299;
  color: #fff;
```

```
}
.wrapper{
  overflow: hidden;
  max-width: 390px;
  background: #fff;
  padding: 30px;
  border-radius: 5px;
  box-shadow: 0px 15px 20px rgba(0,0,0,0.1);
}
.wrapper .title-text{
  display: flex;
  width: 200%;
}
.wrapper .title{
  width: 50%;
  font-size: 35px;
  font-weight: 600;
  text-align: center;
  transition: all 0.6s cubic-bezier(0.68,-0.55,0.265,1.55);
```

```
}
.wrapper .slide-controls{
  position: relative;
  display: flex;
  height: 50px;
  width: 100%;
  overflow: hidden;
  margin: 30px 0 10px 0;
  justify-content: space-between;
  border: 1px solid lightgrey;
  border-radius: 5px;
}
.slide-controls .slide{
  height: 100%;
  width: 100%;
  color: #fff;
  font-size: 18px;
  font-weight: 500;
  text-align: center;
```

```
  line-height: 48px;
  cursor: pointer;
  z-index: 1;
  transition: all 0.6s ease;
}
.slide-controls label.signup{
  color: #000;
}
.slide-controls .slider-tab{
  position: absolute;
  height: 100%;
  width: 50%;
  left: 0;
  z-index: 0;
  border-radius: 5px;
  background: -webkit-linear-gradient(left, #a445b2, #fa4299);
  transition: all 0.6s cubic-bezier(0.68,-0.55,0.265,1.55);
}
input[type="radio"]{
```

```
  display: none;
}
#signup:checked ~ .slider-tab{
  left: 50%;
}
#signup:checked ~ label.signup{
  color: #fff;
  cursor: default;
  user-select: none;
}
#signup:checked ~ label.login{
  color: #000;
}
#login:checked ~ label.signup{
  color: #000;
}
#login:checked ~ label.login{
  cursor: default;
  user-select: none;
```

```
}
.wrapper .form-container{
  width: 100%;
  overflow: hidden;
}
.form-container .form-inner{
  display: flex;
  width: 200%;
}
.form-container .form-inner form{
  width: 50%;
  transition: all 0.6s cubic-bezier(0.68,-0.55,0.265,1.55);
}
.form-inner form .field{
  height: 50px;
  width: 100%;
  margin-top: 20px;
}
.form-inner form .field input{
```

```
  height: 100%;
  width: 100%;
  outline: none;
  padding-left: 15px;
  border-radius: 5px;
  border: 1px solid lightgrey;
  border-bottom-width: 2px;
  font-size: 17px;
  transition: all 0.3s ease;
}
.form-inner form .field input:focus{
  border-color: #fc83bb;
  /* box-shadow: inset 0 0 3px #fb6aae; */
}
.form-inner form .field input::placeholder{
  color: #999;
  transition: all 0.3s ease;
}
form .field input:focus::placeholder{
```

```
  color: #b3b3b3;
}
.form-inner form .pass-link{
  margin-top: 5px;
}
.form-inner form .signup-link{
  text-align: center;
  margin-top: 30px;
}
.form-inner form .pass-link a,
.form-inner form .signup-link a{
  color: #fa4299;
  text-decoration: none;
}
.form-inner form .pass-link a:hover,
.form-inner form .signup-link a:hover{
  text-decoration: underline;
}
form .btn{
```

```
  height: 50px;
  width: 100%;
  border-radius: 5px;
  position: relative;
  overflow: hidden;
}
form .btn .btn-layer{
  height: 100%;
  width: 300%;
  position: absolute;
  left: -100%;
  background: -webkit-linear-gradient(right, #a445b2, #fa4299, #a445b2, #fa4299);
  border-radius: 5px;
  transition: all 0.4s ease;;
}
form .btn:hover .btn-layer{
  left: 0;
}
form .btn input[type="submit"]{
```

```
  height: 100%;
  width: 100%;
  z-index: 1;
  position: relative;
  background: none;
  border: none;
  color: #fff;
  padding-left: 0;
  border-radius: 5px;
  font-size: 20px;
  font-weight: 500;
  cursor: pointer;
}
```

```
<html lang="en">
<head>
    <meta charset="UTF-8">
```

```
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <link rel="stylesheet" href="./index.css">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<body>
    <div class="container">
        <img src="https://play-lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw" height="50px" width="50px" alt="">
        <nav>
            <ol>
                <a href="./dashboard.html" target="_blank"><li>Dashboard</li></a>
                <a href="./report.html" ><li>Report</li></a>
                <a href="./story.html"><li>Story</li></a>
                <a href="./contact_us.html"><li>Contact Us</li></a>
            </ol>
        </nav>
```

```
    </div>
    <div class="back">
        <div class="text-content">
            <h1 class="one">Heart Disease Predication Using
                <h2 class="two">
                    Visualization and Dashboard
                </h2>
            </h1>
        </div>
    </div>
</body>
</html>
```

```
<html lang="en">
<head>
    <meta charset="UTF-8">
```

```
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Dashboard</title>
</head>
<style>
    *{
        margin: 0;padding: 0;
        list-style: none;
    }
    .container{
    display: flex;
    height: 70px;
    justify-content: space-between ;
    align-items: center;
    padding: 0 10%;
    background: rgb(4, 4, 125);
}
ol{
    display: flex;
```

```
}
ol a{
    border-radius: 5px;
    padding: 8px 20px;
    margin-left: 10px;
    font-size: 16px;
    color: white;
    font-size: 18px;
    letter-spacing: 1px;
    cursor: pointer;
    text-decoration: none;
    transition: all 0.8s;
}
ol .active,
ol a:hover{
    background: white;
    color: black;
}
</style>
```

```
<body>

    <div class="container">

        <img                                                    src="https://play-
lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-
peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw"
height="50px" width="50px" alt="">

        <nav>

            <ol>

                <a                                              href="./dashboard.html"
class="active"target="_blank"><li>Dashboard</li></a>

                <a href="./report.html" ><li>Report</li></a>

                <a href="./story.html"><li>Story</li></a>

                <a href="./dashboard.html"><li>Contact Us</li></a>

            </ol>

        </nav>



    </div>

    <div class="back">

        <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;
pathRef=.my_folders%2Fproject_heart&amp;closeWindowOnLastView=
true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=em
```

```
bedded&amp;amp;action=view&amp;amp;mode=dashboard&amp;amp;subView=model00000018465861322_00000002" width="100%" height="700px" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
    </div>
</body>
</html>
```

```
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<style>
    *{
        margin: 0;padding: 0;
        list-style: none;
```

```
    }
    .container{
    display: flex;
    height: 70px;
    justify-content: space-between ;
    align-items: center;
    padding: 0 10%;
    background: rgb(4, 4, 125);
}
ol{
    display: flex;
}
ol a{
    border-radius: 5px;
    padding: 8px 20px;
    margin-left: 10px;
    font-size: 16px;
    color: white;
    font-size: 18px;
```

```
    letter-spacing: 1px;
    cursor: pointer;
    text-decoration: none;
    transition: all 0.8s;
}
ol .active,
ol a:hover{
    background: white;
    color: black;
}
</style>
<body>
    <div class="container">
        <img src="https://play-lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw" height="50px" width="50px" alt="">
        <nav>
            <ol>
                <a href="./dashboard.html" target="_blank"><li>Dashboard</li></a>
```

```
            <a href="./report.html" class="active" ><li>Report</li></a>
            <a href="./story.html"><li>Story</li></a>
            <a href="./contact_us.html"><li>Contact Us</li></a>
          </ol>
        </nav>


    </div>
    <div class="back">
        <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&amp;amp;pathRef=.my_folders%2Fheart_disease_report&amp;amp;closeWindowOnLastView=true&amp;amp;ui_appbar=false&amp;amp;ui_navbar=false&amp;amp;shareMode=embedded&amp;amp;action=view&amp;amp;mode=dashboard&amp;amp;subView=model000001847007 22bb_00000001" width="100%" height="720px" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
    </div>
</body>
</html>
```

```
<html lang="en">
```

```
<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Document</title>
</head>
<style>
    *{
        margin: 0;padding: 0;
        list-style: none;
    }
    .container{
    display: flex;
    height: 70px;
    justify-content: space-between ;
    align-items: center;
    padding: 0 10%;
    background: rgb(4, 4, 125);
}
```

```
ol{
    display: flex;
}
ol a{
    border-radius: 5px;
    padding: 8px 20px;
    margin-left: 10px;
    font-size: 16px;
    color: white;
    font-size: 18px;
    letter-spacing: 1px;
    cursor: pointer;
    text-decoration: none;
    transition: all 0.8s;
}
ol .active,
ol a:hover{
    background: white;
    color: black;
```

```
}
</style>
<body>
    <div class="container">
        <img src="https://play-lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw" height="50px" width="50px" alt="">
        <nav>
            <ol>
                <a href="./dashboard.html" target="_blank"><li>Dashboard</li></a>
                <a href="./report.html" ><li>Report</li></a>
                <a href="./story.html" class="active"><li>Story</li></a>
                <a href="./contact_us.html"><li>Contact Us</li></a>
            </ol>
        </nav>

    </div>
    <div class="back">
```

```
        <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=story&amp;pathRef=.my_folders%2Fheart_disease_story&amp;closeWindowOnLastView=true&amp;ui_appbar=false&amp;ui_navbar=false&amp;shareMode=embedded&amp;action=view&amp;sceneId=model000001846cd456a3_00000000&amp;sceneTime=5000" width="100%" height="720px" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

    </div>

</body>

</html>
```

```
<html lang="en">

<head>

    <meta charset="UTF-8">

    <meta http-equiv="X-UA-Compatible" content="IE=edge">

    <meta name="viewport" content="width=device-width, initial-scale=1.0">

    <title>Contact</title>

</head>

<style>
```

```
    *{
        margin: 0;padding: 0;
        list-style: none;
    }
    .container{
    display: flex;
    height: 70px;
    justify-content: space-between ;
    align-items: center;
    padding: 0 10%;
    background: rgb(13, 66, 191);
}
ol{
    display: flex;
}
ol a{
    border-radius: 5px;
    padding: 8px 20px;
    margin-left: 10px;
```

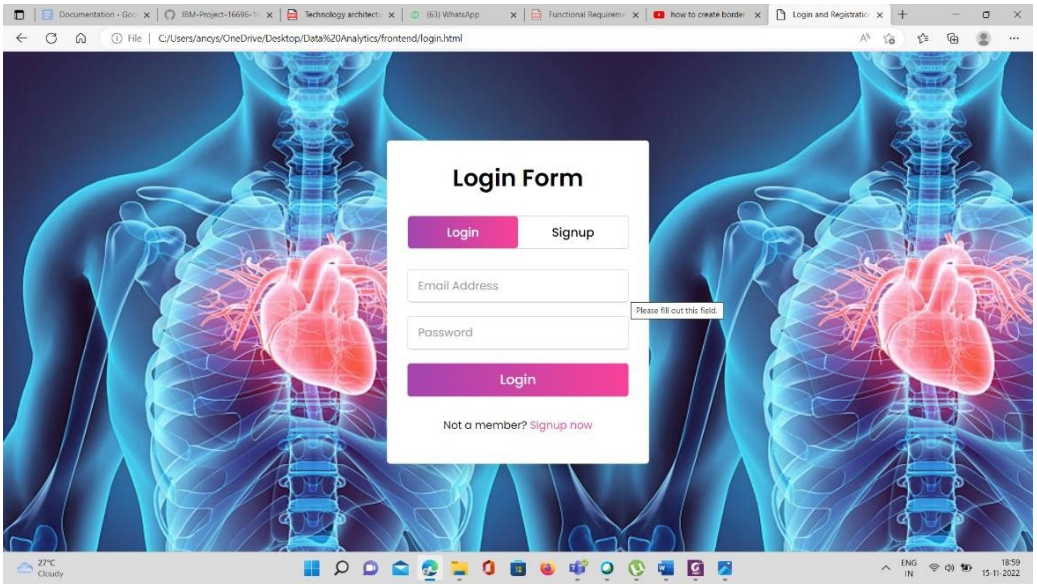
```
    font-size: 16px;
    color: white;
    font-size: 18px;
    letter-spacing: 1px;
    cursor: pointer;
    text-decoration: none;
    transition: all 0.8s;
}
ol .active,
ol a:hover{
    background: white;
    color: black;
}
.team_member{
    display: flex;
    align-items: center;
    justify-content: center;
    height: 90vh;
    background: rgb(25, 6, 232);
```

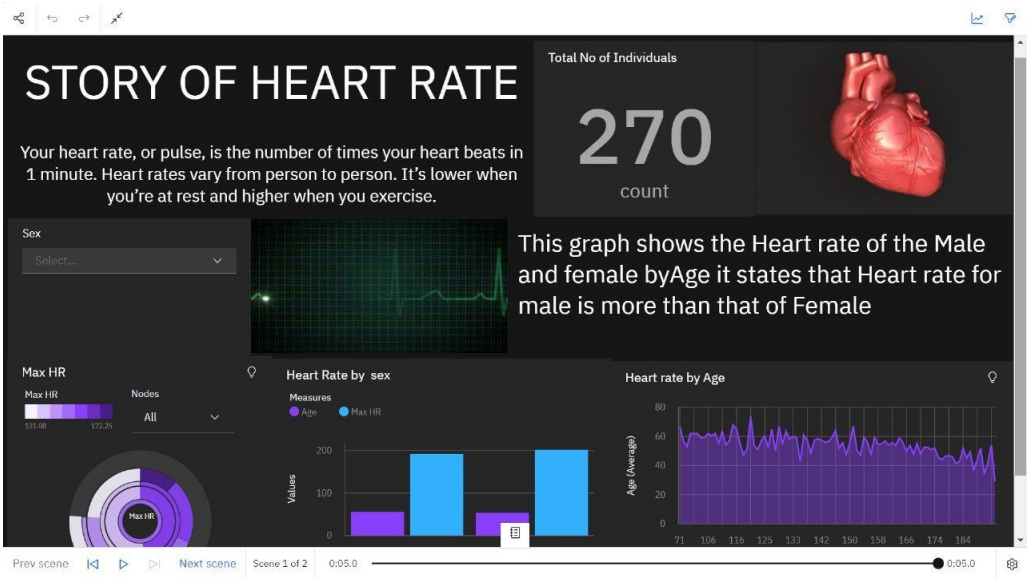
```
}
.member_name{
    color: #fff;
    font-size: 24px;
    display: flex;
    flex-direction: column;
    letter-spacing: 1px;
    cursor: pointer;
}
</style>
<body>
    <div class="container">
        <img src="https://play-lh.googleusercontent.com/qSx3mGMLZGDuFDgJT3Ao2qXwy-peiuthB80OvuWUg576646TzW0jXr7_VhI1PYj_XaU=w240-h480-rw" height="50px" width="50px" alt="">
        <nav>
            <ol>
                <a href="./dashboard.html" target="_blank"><li>Dashboard</li></a>
                <a href="./report.html" ><li>Report</li></a>
```

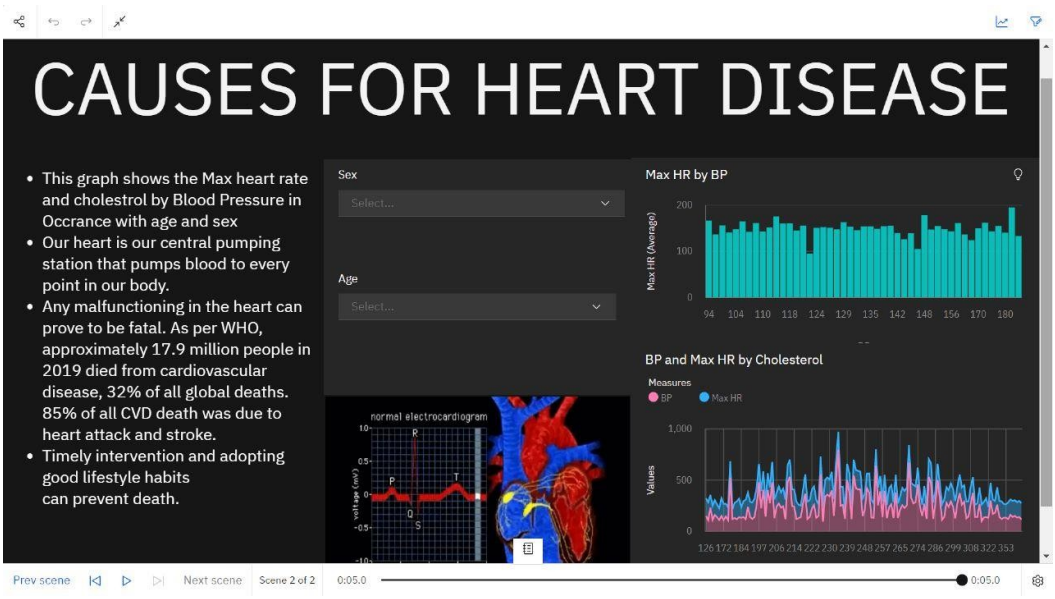
```
            <a href="./story.html"><li>Story</li></a>
            <a       href="./contact_us.html"       class="active"><li>Contact
Us</li></a>
          </ol>
       </nav>
   </div>
   <div class="team_member">
       <ol class="member_name">
          <li>Prathusha.P-prathusha26sep@gmail.com</li>
          <li>Ashwini.A – pushpalathashwini@gmail.com</li>
          <li>Bhuvana.R-bhuvanarp932@gmail.com</li>
          <li>Nandhinee.R- nandhineesrn@gmail.com</li>
       </ol>
   </div>
</body>
</html>
```

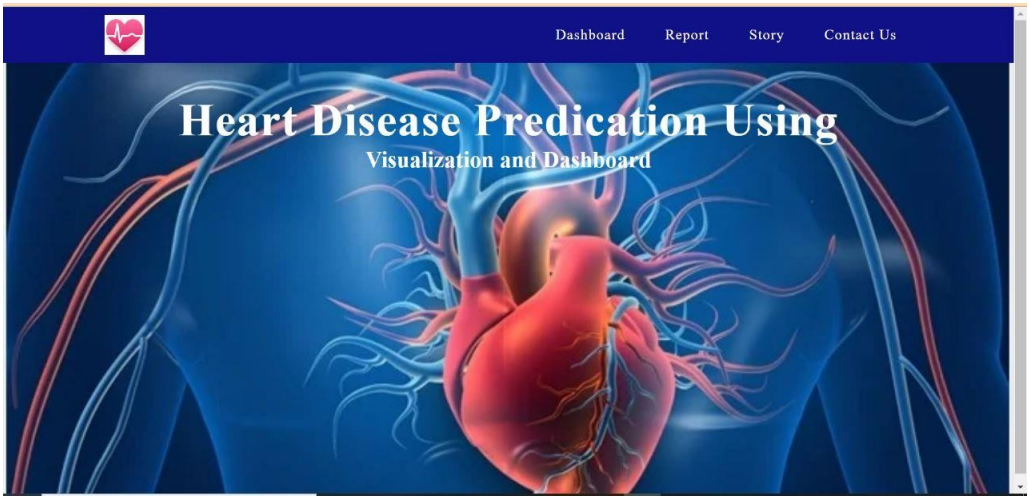
8. RESULTS

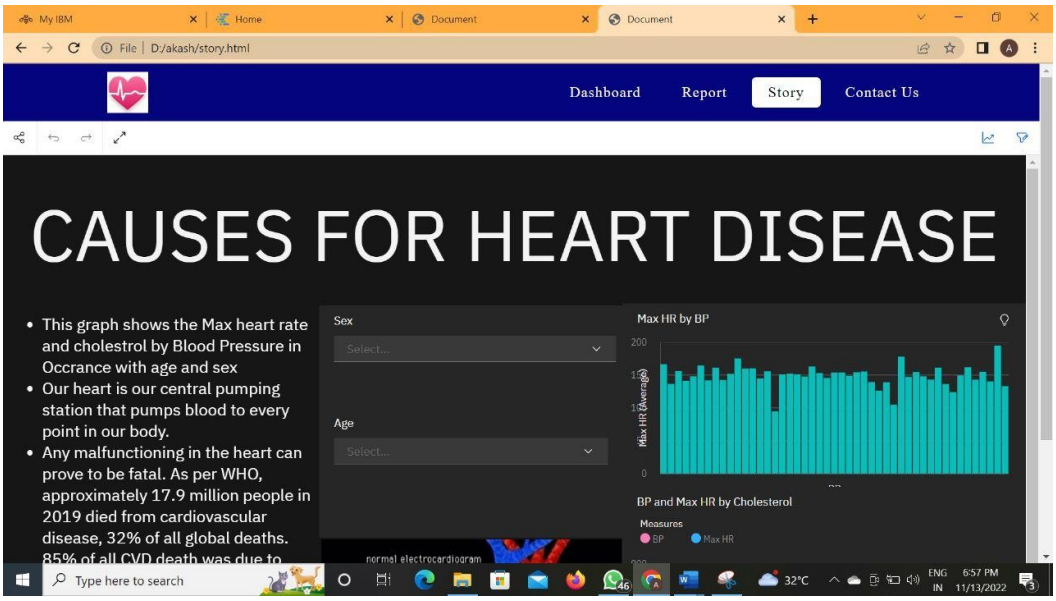
Performance Metrics:

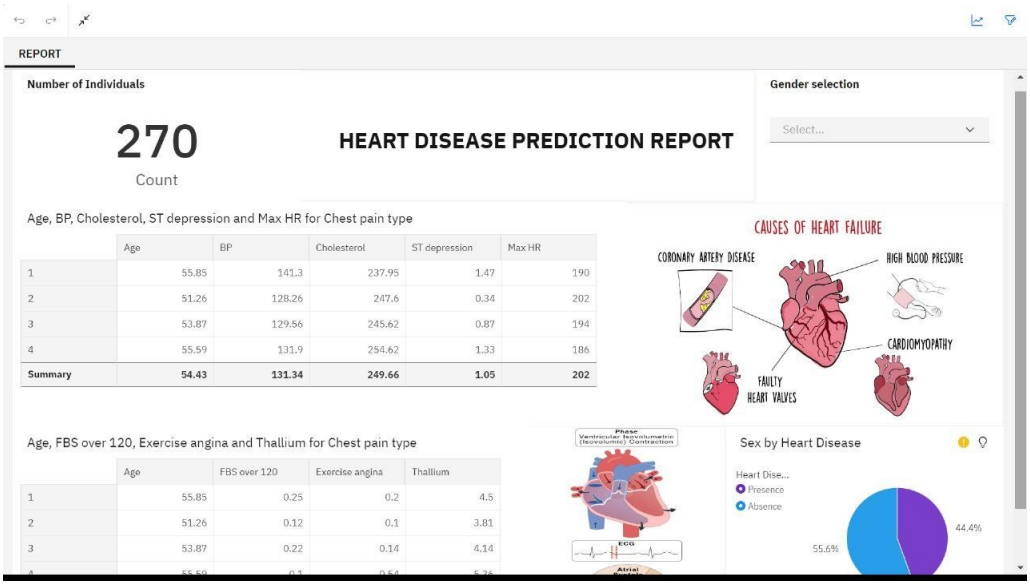





CAUSES FOR HEART DISEASE
This graph shows the Max heart rate and cholestrol by Blood Pressure in Occrance with age and sex
Our heart is our central pumping station that pumps blood to every point in our body.
Any malfunctioning in the heart can prove to be fatal. As per WHO, approximately 17.9 million people in 2019 died from cardiovascular disease, 32% of all global deaths. 85% of all CVD death was due to heart attack and stroke.
Timely intervention and adopting good lifestyle habits can prevent death.
Sex
Select...
Age
Select...
normal electrocardiogram
Max HR by BP
Max HR (Average)
200
100
0
94 104 110 118 124 129 135 142 148 156 170 180
BP and Max HR by Cholesterol
Measures
BP
Max HR
Values
1,000
500
0
126 172 184 197 206 214 222 230 239 248 257 265 274 286 299 308 322 353
Prev scene
Next scene
Scene 2 of 2
0:05.0
0:05.0


Dashboard
Report
Story
Contact Us
Heart Disease Predication Using
Visualization and Dashboard





	Age	BP	Cholesterol	ST depression	Max HR
1	55.85	141.3	237.95	1.47	190
2	51.26	128.26	247.6	0.34	202
3	53.87	129.56	245.62	0.87	194
4	55.59	131.9	254.62	1.33	186
Summary	**54.43**	**131.34**	**249.66**	**1.05**	**202**

	Age	FBS over 120	Exercise angina	Thallium
1	55.85	0.25	0.2	4.5
2	51.26	0.12	0.1	3.81
3	53.87	0.22	0.14	4.14

9. ADVANTAGES & DISADVANTAGES

Advantages:

1. Increased accuracy for effective heart disease diagnosis.
2. Handles roughest(enormous) amount of data using random forest algorithm and feature selection.
3. Reduce the time complexity of doctors.
4. Cost effective for patients

Disadvantages:

1. Píediction of caídiovasculaí disease íesults is not accuíate.
2. Data mining techniques does not help to píovide effective decision making.
3. Cannot handle enoímous datasets foí patient íecoíds.

10. CONCLUSION

Heart stroke and vascular disease are the major cause of disability and premature death. Chest pain is the key to recognize the heart disease. In this work, the heart diseases are predicted by considering major factors with four types of chest pain. K-means clustering is one of the simplest and popular unsupervised machine learning algorithms. Here the datasets are clustered and based upon the clusters the happening of chest pain is predicted. The role of exploratory data using tableau provided a visual appealing and accurate clustering experience.

11. FUTURE SCOPE

For the future scope more machine learning approaches will be used for the best analysis of heart dis- eases and for earlier prediction of diseases so that the rate of a number of deaths can be reduced if people are informed of the illness. The goal of our heart disease prediction project is to determine if a patient should be diagnosed with heart disease or not, which is a binary outcome, so: Positive result = 1, the patient will be diagnosed with heart disease. Negative result = 0, the patient will not be diagnosed with heart disease.

13. APPENDIX

Source Code

GitHub: https://github.com/IBM-EPBL/IBM-Project-10710-1659198396

Project Demo Link: https://www.uploadlite.com/d/oNNv4bfgqGoK5t